



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,469	02/10/2004	Hyeok-beom Lee	45875	9123
1609 7590 03/08/2007 ROYLANCE, ABRAMS, BERDO & GOODMAN, L.L.P. 1300 19TH STREET, N.W. SUITE 600 WASHINGTON,, DC 20036			EXAMINER WANG, CLAIRE X	
			ART UNIT 2624	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/08/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/774,469

Applicant(s)

LEE, HYEOK-BEOM

Examiner

Claire Wang

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 09/03/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The abstract of the disclosure is objected to because line 4 of the abstract contains two periods behind the word "therein". Correction is required. See MPEP § 608.01(b).
2. The abstract of the disclosure is objected to because it contains more than 150 words. Correction is required. See MPEP § 608.01(b).

### ***Claim Objections***

3. Claims 8, 14 and 17 objected to because of the following informalities:  
In line 5 of claim 8, line 3 of claim 14, and lines 4 and 6 of claim 17, the phrase "data base" should be changed to "database."  
Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 9-12 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamazaki et al. (US 2003/0142209 hereinafter "Yamazaki").

As to claim 1, Yamazaki teaches a monitoring system to detect and record an image at a monitored position (means for monitoring a moving object using a CCD camera and recording the image of the object, Paragraph [0002] lines 1-2), the system comprising an image-capturing photographing unit adapted to capture at least one photographic image and communicate said image as an image video signal (CCD camera converts an image taken by the zoom lens into a video signal, [0019] lines 7-8); a candidate area detection and decision unit adapted to evaluate said image video signal to detect a human skin color candidate area within said image (the system is to track a predetermined flesh color, [0006] lines 2-4, 8) and if detected, to direct said image-capturing photographing unit to capture at least one enlarged photographic image of said human skin color candidate area (when the apparatus locks onto a person to be tracked it zooms in to the face portion for enlargement, [0020] lines 10-13)

Art Unit: 2624

and output said enlarged photographic image as an enlarged image video signal (a frame grabber receives the video signal from the CCD camera converts the image and selectively transfers the video signal to memory, [0019] lines 10-16); a face detection unit adapted to evaluate said enlarged image video signal to detect a face video signal within said enlarged image video signal (when the apparatus locks onto a person to be tracked it zooms in to the face portion for enlargement, [0020] lines 10-13); and a storage and retrieval unit to receive and store said detected face video signal (CPU is able to store the plurality of frames into memory, [0003] lines 21-23; the CPU retrieves the frame data stored in the frame memory, [0005] lines 2-3).

As to claim 13, Yamazaki teaches a monitoring system for analysis, storage and retrieval of an image, the system comprising: an image photographing unit adapted to capture at least one of a normal and an enlarged video signal of an image (CCD camera converts an image taken by the zoom lens into a video signal, [0019] lines 7-8); a candidate detection unit adapted to evaluate said captured normal video signal to detect a human skin candidate area based upon a color range (the system is to track a predetermined flesh color, [0006] lines 2-4, 8) and control said image photographing unit to capture an enlarged video signal of said human skin candidate area (when the apparatus locks onto a person to be tracked it zooms in to the face portion for enlargement, [0020] lines 10-13); a face detection unit adapted to evaluate said captured enlarged video signal of said human skin candidate area to detect a facial image video signal (when the apparatus locks onto a person to be tracked it zooms in

Art Unit: 2624

to the face portion for enlargement, [0020] lines 10-13); and a storage and retrieval unit adapted to store said facial image video signal (CPU is able to store the plurality of frames into memory, [0003] lines 21-23; the CPU retrieves the frame data stored in the frame memory, [0005] lines 2-3).

As to claim 15, it is the method claim of claim 1. Please see claim 1 for detail analysis.

As to claim 2, Yamazaki teaches wherein said candidate area detection and decision unit further comprising, a color difference signal calculation unit adapted to compare a color difference signal level of said video signal with a reference range (the flesh color must fall within a range between an upper limit and a lower limit, [0026] lines 13-17) and to digitize said video signal as a first or second value based upon said comparison (skin colored pixels are set to "1" in a binary image and an area is identified when pixels having a "1" value congregate; [0027] lines 9-11); and a skin color candidate area detection unit adapted to compare at least one of said first and second values with a threshold value detect a skin color candidate area (RGB values are converted into HVS values and those values are put through a threshold test to determine whether the flesh color is present, [0026] lines 8-12).

As to claim 3, Yamazaki teaches wherein said first value indicates a color difference signal level of said video signal within said reference range (the areas with flesh coloring is set to "1" value, [0027]); and said second value indicates a color difference signal level of said video signal outside said reference range (the areas without flesh coloring is set to "0" value, [0027]).

As to claim 4, Yamazaki teaches wherein said candidate area detection and decision unit further comprises a decision unit adapted to normalize said skin color candidate area (the number of effective pixels is equal to or above half the total number of pixels in the Y direction, then the designated coordinates are set to be effective, [0025] lines 9-12) and to determine if said normalized skin color candidate area is a human skin color candidate area (the flesh color must fall within a range between an upper limit and a lower limit, [0026] lines 13-17).

As to claim 9, Yamazaki teaches wherein said storage and retrieval unit further comprises a key manipulation unit to direct said capturing, storage and retrieval of at least one of said image video signal, enlarged image video signal and detected face video signal (CPU is able to retrieve and store the images of the whole body of the moving object and zoomed-in image thereof; [0019] lines 21-26).

Art Unit: 2624

As to claim 10, Yamazaki teaches wherein said photographing unit further comprises a pan, tilt and zoom mechanism for capturing said photographic image and said enlarged photographic image (a panhead for panning and tilting the video camera device, [0003] lines 4-5; CCD camera equipped with zoom lens, [0019] lines 7-8).

As to claim 11, Yamazaki teaches a switching unit adapted to selectively switch one among said candidate area detection and decision unit and said face detection unit to provide said image video signal (Yamazaki shows that his invention is able to detect both whole body of a person or the face of a person, in [0020] lines 10-13 teaches that once a person is being tracked the apparatus shifts to face tracking mode).

As to claim 12, Yamazaki teaches a filter adapted to filter noise from said digitized video signal (a "noise table" is used store any content that the system considers to be noise, Fig. 11 step 10-12).



***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being obvious over Yamazaki in view of Sung et al. (US 2005/0094849 hereinafter "Sung").

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Art Unit: 2624

As to claim 5, Yamazaki teaches wherein said face detection unit further comprises a first face candidate area detection unit adapted to use a pattern with said enlarged image video signal to detect a face candidate area (once the facial area candidates are determined they are put through a test to see if the size of the moving object actually correspond to a face, [0028]). However Yamazaki does not teach a second face candidate area detection unit adapted to use a low-resolution support vector machine to detect a specific candidate area within said detected face candidate area and a final face detection unit adapted to use a high-resolution support vector machine to detect a face video signal within said specific candidate area.

Sung teaches an apparatus to detect a face using a low-resolution support vector machine and a high-resolution support vector machine ([0011]). Where only patterns classified as a face as the result of a first level classification at a low resolution are subjected to a second level classification at a high resolution ([0043] lines 10-15). Thus Sung's apparatus to detect a face reads on the claimed face candidate area detection unit. Therefore, it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Yamazaki's monitoring system with Sung's low and high resolution support vector machine in order to increase the classification speed ([0043] lines 1-2).

As to claim 16, it is the method claim of claim 5. Please see claim 5 for detail analysis.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki and Sung as applied to claims 5 and 16 above, and further in view of Sannoh et al. (US 2003/0071908 hereinafter "Sannoh").

As to claim 6, Yamazaki does not teach wherein said first face candidate area detection unit uses an M-rid Gabor Wavelet pattern with said enlarged image video signal to detect said face candidate area. Sannoh teaches the CPU detects a human face from image data using Gabor Wavelet transform + graph matching ([0092] lines 10-13). Thus Sannoh's method of detecting a human face reads on the claimed method of face detection. Therefore it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Yamazaki and Kim's moving object monitoring method with Sannoh's method of detecting a human face because the use of Gabor Wavelet transform is well known (Sannoh [0092] lines 10-13).

9. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Sannoh.

As to claim 8, Yamazaki teaches wherein said storage and retrieval unit further comprises a database generation unit to create a database based upon at least one of said image video signal, enlarged image video signal and detected face video signal; a recording unit to store at least one of said image video signal, enlarged image video signal and detected face video signal (image database, Fig. 1). Yamazaki does not

Art Unit: 2624

teach a compression/decompression unit to compress or decompress at least one of said image video signal, enlarged image video signal and detected face video signal; and a monitor to display at least one of said image video signal, enlarged image video signal and detected face video signal.

Sannoh teaches an imaging device that comprises a compression/expansion circuit (105 Fig. 2), a face detection function for detecting a face of a subject ([0002] lines 4-5) and a liquid crystal monitor to display the image to the user ([0033]). Thus the imaging device of Sannoh reads on the claimed compression/decompression, face detection and display units. Therefore it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Yamazaki's monitoring system with Sannoh's imaging system create a more effective monitoring system that is able to save on memory and be more user friendly.

As to claim 17, Yamazaki teaches recording said compressed face image video signal and said database ([0019] lines 20-28). However, Yamazaki does not teach compressing said face image video signal and generating a face image database for said signal. Sannoh teaches an imaging device that comprises a compression/expansion circuit (105 Fig. 2). Thus the imaging device of Sannoh reads on the claimed compressing the image. Therefore it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Yamazaki's monitoring system with Sannoh's imaging system create a more effective monitoring system that is able to save on memory.

Art Unit: 2624

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki and Sung as applied to claims 5 and 16 above, and further in view of Porter et al. (US 2006/0198554 hereinafter "Porter").

As to claim 7, Yamazaki and Kim do not teach said second face candidate area detection unit uses a Principal Component Analysis to generate a plurality of face and non-face feature vectors for use with said support vector machine. Porter teaches face images being similar in overall configuration may be described by a relatively low dimensional subspace, thus Principal Component Analysis may be used to determine the principal eigenvectors which defines the face space of the image. Thus Porter's use of Principal Component Analysis reads on the claimed Principal Component Analysis. Therefore it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Yamazaki and Kim's monitoring system with Porter's use of Principal Component Analysis in order to find the vectors that best account for the distribution of the face images within the entire image space (Porter [0323] lines 4-6).

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki.

12. As to claim 14, Yamazaki teaches storing and retrieving the images in and out of a database ([0019] lines 20-28). Yamazaki does not expressly disclose that a database

Art Unit: 2624

of said facial image video signals adapted to allow a user to search for a desired normal, enlarged and facial image video signal from a large amount of recorded video signals. However, Examiner takes Official Notice that a user is able to search through a database and get the desired content from the database well known in the art. It would have been obvious at the time of the invention was made to one of ordinary skill in the art to add a user interface to Yamazaki's monitoring system to since Examiner takes official notice that a user interface to allow searching through the database is well known.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lao et al. (US 2004/0208114) teaches an image pickup device.

Kim et al. (US 2004/0017930) teaches a system for detecting and tracking a plurality of faces in real time.

Smith et al. (US 6,927,694) teaches an algorithm for monitoring the head and eye motion for drivers.

Art Unit: 2624

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Claire Wang whose telephone number is 571-270-1051. The examiner can normally be reached on Mid-day flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Claire Wang  
03/01/2007



JOSEPH MANCUSO  
SUPERVISORY PATENT EXAMINER